The Description of a Lepidopterous Ovum.

By Hy. J. TURNER, F.E.S.

It has been suggested to me at various times that a schedule of the chief points to note in the description of a lepidopterous ovum would be very useful to some of our more enthusiastic field workers. Some years ago, simply for my own use, I compiled a rough list of such details as I found mentioned in a large number of descriptions of ova given by different writers. This I have revised and added to, but before publishing it I thought it would be advisable to submit it to Dr. Chapman for his criticism and opinion. His remark in his private note to me was somewhat strong, but probably as a preface to his criticism and advice, herewith included, it will serve its purpose to drive forward a more perfect registration of facts, in opposition to the tendency to mark time for an indefinite period at certain stages of our scientific methods.

Dr. Chapman says (*in litt.*):—"Although it condemns some of my own work as prehistoric, I have written a short introduction that you may use or not as you like."

He then goes on to say:—"M. Oberthür contends, and we have no higher authority, that no name of a lepidopteron should be valid that is not founded on a good figure, a description alone being the source of many of our difficulties in nomenclature. Our superstitious veneration for a description dates from a time when a good figure was, in, say, ninety-nine cases out of a hundred, an unattainable luxury. Things are different now-a-days. Substituting usefulness for validity, the same auguments and conditions are even more applicable to eggs. The best descriptions of eggs are, perhaps, Scudder's, how few, however, read them, and how evanescent that number would be without his figures to enable them to grasp them. To "describe" an egg you must take a photograph such as Mr. A. E. Tonge has made us familiar with, you must take two others of rather greater magnification, one vertical and one exactly lateral, two others of still larger magnification to show the details of the sculpture, say, laterally, and still another to show the structure and details of the micropylar area,* like those of Mr. F. Noad Clark.

Written descriptions will then be confined largely to points of Life-History rather than description, it will also elucidate points that for any reason the photographs are hazy about, it will deal with colour, and may refer to any points of relation or distinction from other eggs, or the classificatory value that its structure appears to suggest.

It should, however, if possible, give accurate measurement. Much description may be saved by saying it is a more or less ordinary Pierid, Noctuid, or Geometrid egg, or belongs to those Geometers, whose eggs are becoming upright, or as the case may be.

We now know broadly the characteristics of most groups of the macro- and of some of the micro-lepidoptera, but there are still many of the latter that we know nothing of, and a good many of which we know something, without being able as yet to group them.

It may be useful to have a schedule of points to be dealt with in describing an egg, leaving out those that the photographs sufficiently

* These must all be to a definite standard scale of magnification.—H.J.T.

show. No one will probably try to describe an egg that does not already know something about them, but the most expert may omit some important detail, if without a scheme, a *memoria technica*.

A description of an egg under a hand lens only is practically of little or no use, though it may sometimes be better than nothing."

While fully recognising the logic of the above remarks on most of the questions raised, I do not consider that any points should be omitted from the schedule, but rather that they should be included with some indication that such and such points and details are far better registered by photography. Their inclusion serves to direct the attention of the observer to the particular aspects of the points, which are necessarily to be kept in view to obtain the desired result.

Accurate measurements are of the utmost importance. Roughly, one can obtain the relative sizes of eggs by reference to the photographs if, and the if is emphasised, they are all done to a standard scale. On this subject Dr. Chapman says (*in litt.*) :—" The results of even the best photographers vary fractionally from the scale of enlargement they give, and to secure accuracy, the best method I find to be to make a camera outline of the egg from each point of view, and, at the same time, and on the same paper, mark under the camera from a micrometer scale. Such outlines may sometimes serve instead of those photographs that are only given for the sake of form and measurement."

Mr. F. Noad Clark has very kindly sent me on the following details of two methods of taking the measurement of ova under the microscope. He says :—" One method is by means of a stage micrometer. This is a glass slide ruled in $\frac{1}{100}$ths and $\frac{1}{1000}$ths of an inch or $\frac{1}{10}$ths and $\frac{1}{100}$ths of a millimètre, and costing five shillings. The object is focussed through the microscope with camera attached, as in photomicrography, and the image projected on the ground glass screen is carefully measured with a pair of compasses. The ovum is then replaced by the stage micrometer, and the corresponding measurement of the image of its divisions taken.*

Another method, and the one generally adopted, is by using, in addition to the stage micrometer, an eyepiece micrometer. This is a glass disc ruled with arbitrary divisions, and is placed upon the diaphragm of the eyepiece; the number of divisions corresponding with the object is then noted and read off on the stage micrometer, which has meanwhile replaced the object or egg. This method entails the purchase of an eyepiece micrometer, costing five shillings. The "Ramsden" eyepiece micrometer is probably the most convenient of all methods. It is, however, somewhat costly.

For the measurement of the depth or thickness of an object, some microscopes have the fine adjustment screw so graduated that each turn of the screw represents a proportionate measurement in millimetres.

It follows, of course, that, given a photograph or drawing of an egg magnified by a certain stated number of diameters, it is easy to estimate the size of the original by dividing the magnified or reproduced image by the number of diameters."

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* This is my method, F.N.C.

Position :
Date of deposition—time of day.
Where laid.
Method of laying.
Loose, fastened.
Batches, singly. No. in batch.
Covered, naked. With hairs, excretions, etc.
Imbricate, irregular heaps.
Rows or piles.
In cases, crevices.
Hidden, exposed.
Upright or flat.
Relative lengths of 3 axes.
Direction of 3 axes. Relative to surface on which laid.
Influence of surroundings.
Crevice, hairs, other ova.
Size in mm.
Diameters—height.
Constant or not.
Sexual size variation.
Racial variation.
Hibernation—duration of.
Development before — during — after.
Family Characters :
Pierid—Noctuid—etc.
General appearance :
Of the batch—resemblances.
Of the ovum.
Colour—at deposition. Relation to surface on which laid.
Colour—after deposition. Relation to altered surface (winter changes).
Colour—before hatching.
Colour—at hatching.
Periods of change.
Shape—dahlia-like and hemispherical, globular, ovoid, oblong, tiarate, scale-like, etc. (must be accurately given by photographs).
False ribbing (caused by pressure of hairs of plant, etc.)
Microscopic Characters :
(Exact sculpturing to be figured as well as described).
Surface.
Smooth — rough — pitted — transparent—glossy—dull—opaque—etc.
Hairy—papillose.
Position of hairs—length.
Changes in surface.
When—why.
Colour influenced by changes in character of surface.
Ribbing.
Number of ribs. Constant or otherwise.
Long—short—anastomosing.
Relation to micropylar area.
Continued to base or not.
Edges even or saw-like.
Reticulation.
Regular or irregular.
Cross ribbing. Fine or large. Sunk or raised.
Micropyle.
Position on ovum.
Depressed—flat—raised.
Composition.
Size—shape of central cell.
No. of radiate cells. Shape of cells. Constancy of no. of cells. Relation to ribs.

What is Polyommatus ariana, Moore?

By GEORGE WHEELER, M.A., F.Z.S., F.E.S.

(*Concluded from page* 88.)

Butler (*Proc. Zool. Soc. Lond.*, 1886, p. 368) speaks of *ariana* Moore, as being taken at Murree on the 8th and 11th of August and the 3rd of September, 1885, two of the latter specimens ♂ and ♀ are in the British Museum coll. and are of the *icarus* form. Butler however (*Ann. & Mag. Nat. Hist.*, 6th ser., i., p. 148, 1888) writes later as follows: *C. ariana*, ♀ Thundiani, 19th August; ♂ ♀ (*in coitû*) 29th August, 10th September; ♀ 15th and 24th September, 1886. All the specimens with the exception of one taken on 19th August rather small for the species; the ♀ appears to vary almost as much as in *C. icarus* of Europe." Of these Thundiani specimens six (3 ♂, 3 ♀) including the large one and 2 of those taken *in coitû*, *viz.*, the pair taken 29th August, are in the British Museum coll. and present further difficulties. They are very square and compact looking, a complete contrast to *eros*; the ♂ s of a dark but bright blue on the upperside, the ♀ s being almost typical *icarus*, but all on the underside varying greatly as to the amount of orange spotting and of blue scaling, the large ♂ may be put out of the question as belonging, in spite of its